

## INDEX TO TYPED SET OF PAPERS

| Annexure No. | Description   | Date       | Pages   |
|--------------|---|------------|---------|
| 1            | Report along with enclosures regarding the source of contamination and also the remedial measures to be taken for the purpose of improving the water quality in the Murungapakkam (Velrampet) and Olandai Lakes | 09.11.2021 | 5 to 23 |

*Arumugam*  
**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY.**

**ANNEXURE -I**

**BEFORE THE NATIONAL GREEN TRIBUNAL  
SOUTHERN ZONE, CHENNAI  
ORIGINAL APPLICATION No.129 of 2020(SZ)**

\*\*\*

**REPORT FILED BY THE PUDUCHERRY POLLUTION CONTROL COMMITTEE REGARDING THE SOURCE OF CONTAMINATION AND ALSO THE REMEDIAL MEASURES TO BE TAKEN FOR THE PURPOSE OF IMPROVING THE WATER QUALITY IN THE MURUNGAPAKKAM (VELRAMPET) AND OLANDAI LAKES AS PER THE ORDERS DATED 15.09.2021 AND 06.10.2021 OF THE HON'BLE NGT(SZ)**

\*\*\*

In the matter of OA No.129 of 2020 (SZ), the Hon'ble National Green Tribunal , Southern Zone, Chennai vide its orders dated 15.09.2021 and 06.10.2021 directed the Puducherry pollution Control Committee to file a report regarding the source of contamination and also the remedial measures to be taken for the purpose of improving the water quality in the Murungapakkam(Velrampet) and Olandai Lakes.

The Murungapakkam(Velrampet) and Olandai Lakes are being used for rain water storage, ground water re-charging and propagation of fisheries . The Puducherry Pollution Control Committee has taken water samples at two locations each from Murungapakkam(Velrampet) and Olandai Lakes on 04.08.2020, 10.11.2020,15.03.2021,28.07.2021 and 11.10.2021. As per the analytical reports, the water quality of both the lakes are detailed below;

**MURUNGAPAKKAM (VELRAMPET) LAKE:**

| <b>Date of sampling</b> | <b>Water quality as per the Analytical reports</b>  |
|-------------------------|---|
| 04.08.2020              | <ul style="list-style-type: none"><li>i. The depth of water body is varied from 1 feet to 3 feet.</li><li>ii. The lake is covered with Aquatic Plants (Water Lily), Algae and Weeds.</li><li>iii. The Water quality is not meeting the Class A, B &amp; C Standards as per the Designated Best Use Water Quality Criteria prescribed by the CPCB for surface water.</li><li>iv. The water quality is partially meeting the Class D Standards.</li><li>v. pH is meeting the standard. The Dissolved Oxygen (DO), the basic criteria for survival of aquatic life, is not meeting the standard at one location.</li></ul> |
| 10.11.2020              | <ul style="list-style-type: none"><li>i. The depth of water body is 3 feet.</li><li>ii. The lake is covered with Aquatic Plants (Water Lily), Algae and Weeds.</li><li>iii. The Water quality is not meeting the Class A, B &amp; C Standards.</li><li>iv. The water quality is partially meeting the Class D Standards.</li><li>v. pH is meeting the standard. The DO is not meeting the standard at two locations.</li></ul>  |

  
**MEMBER SECRETARY  
PUDUCHERRY POLLUTION  
CONTROL COMMITTEE  
PUDUCHERRY.**

|            |   |
|------------|---|
| 15.03.2021 | <ul style="list-style-type: none"> <li>i. The depth of water body is 2 feet.</li> <li>ii. The lake is covered with Aquatic Plants (Water Lily) Algae and Weeds.</li> <li>iii. The Water quality is not meeting the Class A &amp; B Standards.</li> <li>iv. The water quality is meeting the Class C &amp; D Standards.</li> <li>v. pH is meeting the standard. The DO is meeting the standard at two locations. BOD is meeting the standard at two locations.</li> </ul>  |
| 28.07.2021 | <ul style="list-style-type: none"> <li>i. The depth of water body is 3 feet.</li> <li>ii. The lake is covered with Aquatic Plants (Water Lily) Algae and Weeds.</li> <li>iii. The Water quality is not meeting the Class A &amp; B Standards.</li> <li>iv. The water quality is partially meeting the Class C &amp; D Standards. pH is meeting the standard. The DO is not meeting the standard at one location. BOD is meeting the standard at two locations.</li> </ul> |
| 11.10.2021 | <ul style="list-style-type: none"> <li>i. The depth of water body is 3 feet.</li> <li>ii. The lake is covered with Aquatic Plants (Water Lily), Algae and Weeds.</li> <li>iii. The Water quality is not meeting the Class A &amp; B Standards.</li> <li>iv. The water quality is meeting the Class C &amp; D Standards. pH is meeting the standard. The DO is meeting the standard at two locations. BOD is meeting the standard at two locations.</li> </ul>             |

**CONCLUSION:**

Out of 5 time samplings;

- i. the water quality is partially meeting the Class D standards on 2 times.
- ii. the water quality is partially meeting the Class C & D standards on 1 time.
- iii. the water quality is meeting the Class C & D standards on 2 times.

Lower depth of water and surface covered with aquatic plants may be the reason for non- meeting of DO Standard at 4 locations out of 10 locations under Class D ( Propagation of Wild life and Fisheries). In general there is improvement in the water quality due to increase in water depth.

**OLANDAI LAKE:**

| Date of sampling | Water quality as per the Analytical reports   |
|------------------|---|
| 04.08.2020       | <ul style="list-style-type: none"> <li>i. The depth of water body is 2.5 feet.</li> <li>ii. The lake is covered with Aquatic Plants (Water Hyacinth), Algae and Weeds.</li> <li>iii. The Water quality is not meeting the Class A, B &amp; C Standards as per the Designated Best Use Water Quality Criteria prescribed by the CPCB for surface water.</li> <li>iv. The water quality is partially meeting the Class D Standards.</li> <li>v. pH is meeting the standard. The Dissolved Oxygen(DO), the basic criteria for survival of aquatic life, is not meeting the standard at two locations.</li> </ul> |

  
**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY**

|            |  |
|------------|--|
| 10.11.2020 | <ul style="list-style-type: none"> <li>i. The depth of water body is varied from 2.5 feet to 3 feet.</li> <li>ii. The lake is covered with Aquatic Plants(Water Hyacinth), Algae and Weeds.</li> <li>iii. The Water quality is not meeting the Class A, B &amp; C Standards.</li> <li>iv. The water quality is partially meeting the Class D Standards.</li> <li>v. pH is meeting the standard. The DO is not meeting the standard at one location.</li> </ul> |
| 15.03.2021 | <ul style="list-style-type: none"> <li>i. The depth of water body is 2 feet.</li> <li>ii. The lake is covered with Aquatic Plants (Water Hyacinth), Algae and Weeds.</li> <li>iii. The Water quality is not meeting the Class A, B &amp; C Standards.</li> <li>iv. The water quality is partially meeting the Class D Standards.</li> <li>v. pH is meeting the standard. The DO is not meeting the standard at two locations.</li> </ul>                       |
| 28.07.2021 | <ul style="list-style-type: none"> <li>i. The depth of water body is 3 feet.</li> <li>ii. The lake is covered with Aquatic Plants (Water Hyacinth), Algae and Weeds.</li> <li>iii. The Water quality is not meeting the Class A, B &amp; C Standards.</li> <li>iv. The water quality is partially meeting the Class D Standards. pH is meeting the standard. The DO is not meeting the standard at two locations.</li> </ul>                                   |
| 11.10.2021 | <ul style="list-style-type: none"> <li>i. The depth of water body is 3 feet.</li> <li>ii. The lake is covered with Aquatic Plants (Water Hyacinth), Algae and Weeds.</li> <li>iii. The Water quality is not meeting the Class A, B &amp; C Standards.</li> <li>iv. The water quality is partially meeting the Class D Standards. pH is meeting the standard. The DO is meeting the standard at two locations.</li> </ul>                                       |

#### CONCLUSION:

Out of 5 time samplings;

- i. the water quality is not meeting the Class A, B & C standards on 5 times.
- ii. the water quality is partially meeting the Class D standards on 5 times.

Lower depth of water and surface fully covered with dense aquatic plants may be the reason for non- meeting of DO Standard at 9 locations out of 10 locations under Class D (Propagation of Wild life and fisheries. Poor water quality is due to non- dredging or de-weeding of thickly covered aquatic plants.

The Analytical Reports of water samples of both the lakes are enclosed as **Annexure -II**

The Designated Best Use Water Quality Criteria prescribed by the CPCB for surface water is enclosed as **Annexure-III**

*Amey*  
**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY.**

## INSPECTION OF LAKES:

Both the lakes are inspected on 06.11.2021 by the Officials of Puducherry Pollution Control Committee. The following observations are made during the inspection;

- i. Both the lakes are with full capacity of water.
- ii. The Murungapakkam (Velrampet) lake is partially covered with Aquatic Plants (Water Lily and Hyacinth), Algae and Weeds.
- iii. The Olandai lake is thickly covered with dense Aquatic Plants (Water Hyacinth and Lily), Algae and Weeds.
- iv. The excess water from the lakes is discharged through sluice by natural gradient.
- v. Formation of internal bunds are not found inside the lakes.
- vi. Discharge of any effluent or sewage into the lakes is not noticed.

The inspection report along with photographs is enclosed as **Annexure- IV**.

## SOURCE OF CONTAMINATION AND ALSO THE REMEDIAL MEASURES TO BE TAKEN FOR THE PURPOSE OF IMPROVING THE WATER QUALITY IN BOTH THE LAKES:

There is no possibility of pollution caused to these water bodies as there is no source of discharge of effluent or sewage in to both the lakes. However the lower depths of water during some seasons with respect to both the lakes and total coverage of surface water with dense aquatic plants with respect to Olandai lake may be the reasons or source of contamination for poor water quality. The relevant remedial measures as per the CPCB Indicative guidelines for restoration of water bodies are;

**De-Siltation** : Periodic removal of nutrient enriched accumulated sludges in ponds and lakes help in ground water recharge potential, removal of contaminated sediments as well as increases storage capacity of lakes or ponds.

**De-Weeding**: Periodic dredging (once in three months) of 80% of dense and thickly covered aquatic plants Viz., floating plant such as algae, duckweed, watermeal, water hyacinth: submerged plants such as milfoil, hydrilla, water lettuce, curly-leaf pondweed, clasping-leaf pondweed, coontail sago pondweed, water lilly, water shield etc., bottom sediment, and associated nutrients should be carried out. De-weeding methods include: -

**Preventive measures**: Such as proper design and construction of pond or lakes including levelling and smoothing of banks, Physical Control Measures, Mechanical Control Measures and Biological Controls.

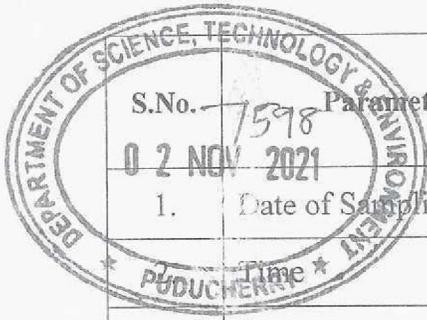
Relevant extract of the CPCB Indicative guidelines for restoration of water bodies is enclosed as **Annexure – V**

\*\*\*

  
**MEMBER SECRETARY**  
PUDUCHERRY POLLUTION  
CONTROL COMMITTEE  
PUDUCHERRY.

**ANNEXURE-II**

**GOVERNMENT OF PUDUCHERRY  
DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT  
PUDUCHERRY POLLUTION CONTROL COMMITTEE**



| S.No. | Parameters                     | Velrampet Lake (South) | Velrampet Lake (North East) | Olandai Lake (South East) | Olandai Lake (South)  |
|-------|--------------------------------|------------------------|-----------------------------|---------------------------|-----------------------|
| 1.    | Date of Sampling               | 04.08.2020             | 04.08.2020                  | 04.08.2020                | 04.08.2020            |
|       | Time                           | 09.45 A.M              | 10.00 A.M                   | 10.20 A.M                 | 10.45 A.M             |
| 3.    | Weather                        | Cloudy                 | Cloudy                      | Cloudy                    | Cloudy                |
| 4.    | Depth of Water Body            | 1 Feet                 | 1 M                         | 0.75 M                    | 0.75 M                |
| 5.    | Floating Matter                | Water Lily, Algae      | Water Hyacinth, Algae       | Algae                     | Water Hyacinth, Algae |
| 6.    | Colour                         | Light Green            | Light Green                 | Light Green               | Light Green           |
| 7.    | Latitude                       | 11° 54' 25.95"         | 11° 54' 50.46"              | 11° 54' 52.34"            | 11° 54' 52.27"        |
| 8.    | Longitude                      | 79° 47' 49.29"         | 79° 48' 1.94"               | 79° 48' 2.69"             | 79° 47' 51.99"        |
| 9.    | Temp °C                        | 29.0                   | 29.0                        | 29.0                      | 29.0                  |
| 10.   | pH                             | 7.56                   | 8.15                        | 7.84                      | 7.83                  |
| 11.   | Conductivity (µS/cm)           | 1092                   | 1034                        | 1287                      | 1078                  |
| 12.   | DO (mg/l)                      | 1.6                    | 4.8                         | 2.0                       | 2.6                   |
| 13.   | COD (mg/l)                     | 64.0                   | 56.0                        | 64.0                      | 76.0                  |
| 14.   | BOD (mg/l)                     | 6.5                    | 5.5                         | 6.0                       | 7.5                   |
| 15.   | NH <sub>3</sub> -N (mg/l)      | BDL                    | BDL                         | BDL                       | BDL                   |
| 16.   | NO <sub>3</sub> -N (mg/l)      | BDL                    | BDL                         | BDL                       | BDL                   |
| 17.   | NO <sub>2</sub> -N (mg/l)      | BDL                    | BDL                         | BDL                       | BDL                   |
| 18.   | Nitrate (mg/l)                 | 0.0297                 | 0.0137                      | 0.0093                    | 0.0110                |
| 19.   | TSS (mg/l)                     | 43.0                   | 31.0                        | 21.0                      | 19.0                  |
| 20.   | Sulphate (mg/l)                | 13.3                   | 12.08                       | 2.17                      | 7.25                  |
| 21.   | Phosphate (mg/l)               | 0.1020                 | 0.09112                     | 2.62                      | 2.41                  |
| 22.   | Total Coliform MPN/100 ml      | 900                    | 1600                        | 1600                      | 500                   |
| 23.   | Faecal Coliform MPN/100 ml     | 500                    | <2                          | <2                        | <2                    |
| 24.   | Faecal Streptococci MPN/100 ml | 23                     | <2                          | <2                        | 13                    |

Note: Water samples are not meeting the designated best use water quality criteria prescribed by the CPCB for surface water class "A", "B" and "C".

**MEMBER SECRETARY  
PUDUCHERRY POLLUTION  
CONTROL COMMITTEE  
PUDUCHERRY.**

*(G. Rukmani)*  
Scientist II

**GOVERNMENT OF PUDUCHERRY**  
**DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT**  
**PUDUCHERRY POLLUTION CONTROL COMMITTEE**

| S.No. | Parameters                           | Olandai<br>(Near Boat<br>House)<br>I | Velrampet<br>(At Boat<br>House)<br>II | Olandai<br>(South Side)<br>III  | Velrampet<br>(Near Pump<br>House)<br>IV |
|-------|--------------------------------------|--------------------------------------|---------------------------------------|---------------------------------|---|
| 1.    | Date                                 | 10.11.2020                           | 10.11.2020                            | 10.11.2020                      | 10.11.2020                              |
| 2.    | Time                                 | 10.20 A.M                            | 10.40 A.M                             | 11.00 A.M                       | 11.20 A.M                               |
| 3.    | Weather                              | Cloudy                               | Cloudy                                | Cloudy                          | Cloudy                                  |
| 4.    | Depth of Water<br>Body               | 2.5 feet                             | 3 feet                                | 3 feet                          | 3 feet                                  |
| 5.    | Floating Matter                      | Aquatic plants,<br>algae, weeds      | Aquatic plants,<br>algae, weeds       | Aquatic plants,<br>algae, weeds | Aquatic plants,<br>algae, weeds         |
| 6.    | Colour                               | Light Green                          | Light Green                           | Light Green                     | Light Green                             |
| 7.    | Latitude                             | 11° 54' 52.34"                       | 11° 54' 46.73"                        | 11° 54' 52.27"                  | 11° 54' 25.95"                          |
| 8.    | Longitude                            | 79° 48' 2.69"                        | 79° 47' 50.20"                        | 79° 47' 51.99"                  | 79° 47' 49.29"                          |
| 9.    | Temp °C                              | 28.0                                 | 28.0                                  | 28.0                            | 28.0                                    |
| 10.   | pH                                   | 7.35                                 | 6.94                                  | 6.94                            | 6.82                                    |
| 11.   | Conductivity<br>(mg/l)               | 1197                                 | 1124                                  | 1053                            | 1066                                    |
| 12.   | TSS (mg/l)                           | BDL<br>(DL - 10)                     | 23.0                                  | BDL (DL - 10)                   |   |
| 13.   | DO (mg/l)                            | 6.5                                  | 1.8                                   | 1.3                             | 2.3                                     |
| 14.   | BOD (mg/l)                           | 2.9                                  | 7.0                                   | 3.8                             | 1.3                                     |
| 15.   | COD (mg/l)                           | 16.0                                 | 76.0                                  | 20.0                            | 28.0                                    |
| 16.   | Phosphate (mg/l)                     | 2.3                                  | 1.8                                   | 1.9                             | 1.9                                     |
| 17.   | SO <sub>4</sub> <sup>2-</sup> (mg/l) | 67.4                                 | 60.0                                  | 31.65                           | 25.5                                    |
| 18.   | NH <sub>3</sub> -N (mg/l)            | 0.3                                  | 0.07                                  | 0.02                            | 0.2                                     |
| 19.   | NO <sub>3</sub> -N (mg/l)            | 1.57                                 | 1.9                                   | 1.4                             | 1.8                                     |
| 20.   | NO <sub>2</sub> -N (mg/l)            | 0.04                                 | BDL (DL - 0.02)                       |                                 |   |
| 21.   | Nitrate (mg/l)                       | 6.9                                  | 8.5                                   | 6.4                             | 8.0                                     |
| 22.   | Total Coliform<br>MPN/100 ml         | 540                                  | 920                                   | 350                             | 430                                     |
| 23.   | Faecal Coliform<br>MPN/100 ml        | 350                                  | 430                                   | 280                             | 350                                     |
| 24.   | Faecal<br>Streptococci<br>MPN/100 ml | 240                                  | 210                                   | 170                             | 280                                     |

**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY**

BDL - Below Detectable Limit; DL - Detection Limit

Note: The parameter Dissolved Oxygen (DO) found to be not meeting the basic criteria prescribed for the survival of aquatic life at location II, IV of Velrampet lake and at location III of Olandai lake. The parameter BOD at location II of Velrampet lake and location III of Olandai lake is not meeting the standard prescribed for Class (A), (B) and (C).

**GOVERNMENT OF PUDUCHERRY**  
**DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT**  
**PUDUCHERRY POLLUTION CONTROL COMMITTEE**

| S.No. | Parameters                           | Olandai<br>(Near Boat<br>House)<br>(I) | Olandai<br>(South Side)<br>(II) | Velrampet<br>(Near Pump<br>House)<br>(III) | Velrampet<br>(At Boat House)<br>(IV) |
|-------|--------------------------------------|--|---------------------------------|--|--------------------------------------|
| 1.    | Date                                 | 15.03.2021                             | 15.03.2021                      | 15.03.2021                                 | 15.03.2021                           |
| 2.    | Time                                 | 12.30 P.M                              | 12.50 P.M                       | 12.40 P.M                                  | 01.00 P.M                            |
| 3.    | Weather                              | Clear                                  | Clear                           | Clear                                      | Clear                                |
| 4.    | Depth of Water<br>Body               | 2 Feet                                 | 2 Feet                          | 2 Feet                                     | 2 Feet                               |
| 5.    | Floating Matter                      | Aquatic plants,<br>algae, weeds        | Aquatic plants,<br>algae, weeds | Aquatic plants,<br>algae, weeds            | Aquatic plants,<br>algae, weeds      |
| 6.    | Colour                               | Pale green                             | Pale green                      | Pale green                                 | Pale green                           |
| 7.    | Latitude                             | 11° 54' 52.34"                         | 11° 54' 52.27"                  | 11° 54' 25.95"                             | 11° 54' 46.73"                       |
| 8.    | Longitude                            | 79° 48' 2.69"                          | 79° 47' 51.99"                  | 79° 47' 49.29"                             | 79° 47' 50.20"                       |
| 9.    | Temp °C                              | 30.0                                   | 30.0                            | 31.0                                       | 32.0                                 |
| 10.   | pH                                   | 6.77                                   | 6.80                            | 7.08                                       | 7.40                                 |
| 11.   | TSS (mg/l)                           | 8.0                                    | 17.0                            | 4.0  | 15.0                                 |
| 12.   | DO (mg/l)                            | 2.6                                    | 2.7                             | 4.9  | 6.1                                  |
| 13.   | BOD (mg/l)                           | 2.0                                    | 2.0                             | 3.0  | 1.0                                  |
| 14.   | COD (mg/l)                           | 16.0                                   | 28.0                            | 24.0                                       | 40.0                                 |
| 15.   | Phosphate (mg/l)                     | 0.16                                   | 0.19                            | BDL  | 0.10                                 |
| 16.   | SO <sub>4</sub> <sup>2-</sup> (mg/l) | 16.8                                   | 17.2                            | 13.3                                       | 12.98                                |
| 17.   | NH <sub>3</sub> -N (mg/l)            | BDL (DL-0.01)                          |                                 |  |                                      |
| 18.   | NO <sub>3</sub> -N (mg/l)            | 0.9                                    | 0.97                            | 0.8  | 0.76                                 |
| 19.   | NO <sub>2</sub> -N (mg/l)            | BDL (DL-0.02)                          |                                 |  |                                      |
| 20.   | Nitrate (mg/l)                       | 4.01                                   | 4.28                            | 3.54                                       | 3.38                                 |
| 21.   | Total Coliform<br>MPN/100 ml         | 350                                    | 350                             | 280  | 430                                  |
| 22.   | Faecal Coliform<br>MPN/100 ml        | 210                                    | 210                             | 170  | 220                                  |
| 23.   | Faecal Streptococci<br>MPN/100 ml    | 240                                    | 280                             | 240  | 350                                  |

BDL – Below Detectable Limit;

DL – Detection Limit

Note: The parameter Dissolved Oxygen (DO) found to be not meeting the basic criteria prescribed for the survival of aquatic life at location I, II of Olandai Lake and in case of the Velrampet Lake it is not meeting the standard prescribed for Class (A), (B) at location III.

**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY.**

*(Signature)*  
**(G. Rukmani)**  
**Scientist II**

**GOVERNMENT OF PUDUCHERRY**  
**DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT**  
**PUDUCHERRY POLLUTION CONTROL COMMITTEE**

| S.No. | Parameters                           | Olandai<br>(Near Boat<br>House)<br>I | Velrampet<br>(At Boat House)<br>II | Olandai<br>(South Side)<br>III  | Velrampet<br>(Near Pump<br>House)<br>IV |
|-------|--------------------------------------|--------------------------------------|------------------------------------|---------------------------------|---|
| 1.    | Date                                 | 28.07.2021                           | 28.07.2021                         | 28.07.2021                      | 28.07.2021                              |
| 2.    | Time                                 | 11.45 A.M                            | 11.30 A.M                          | 12.00 P.M                       | 12.30 P.M                               |
| 3.    | Weather                              | Clear                                | Clear                              | Clear                           | Clear                                   |
| 4.    | Depth of Water<br>Body               | 3feet                                | 3 feet                             | 3 feet                          | 3 feet                                  |
| 5.    | Floating Matter                      | Aquatic plants,<br>algae, weeds      | Aquatic plants,<br>algae, weeds    | Aquatic plants,<br>algae, weeds | Aquatic plants,<br>algae, weeds         |
| 6.    | Colour                               | Slightly Green                       | Slightly Green                     | Slightly Green                  | Slightly Green                          |
| 7.    | Latitude                             | 11° 54' 52.34"                       | 11° 54' 46.73"                     | 11° 54' 52.27"                  | 11° 54' 25.95"                          |
| 8.    | Longitude                            | 79° 48' 2.69"                        | 79° 47' 50.20"                     | 79° 47' 51.99"                  | 79° 47' 49.29"                          |
| 9.    | Temp °C                              | 32.0                                 | 32.0                               | 32.0                            | 32.0                                    |
| 10.   | pH                                   | 7.10                                 | 7.32                               | 7.16                            | 7.38                                    |
| 11.   | Conductivity<br>(mg/l)               | 787                                  | 472                                | 804                             | 455                                     |
| 12.   | TSS (mg/l)                           | 22.0                                 | 3.0                                | 38.0                            | 5.0                                     |
| 13.   | DO (mg/l)                            | 0.4                                  | 4.0                                | 1.0                             | 3.5                                     |
| 14.   | BOD (mg/l)                           | 1.0                                  | 0.5                                | 0.5                             | 2.3                                     |
| 15.   | COD (mg/l)                           | 20.0                                 | 28.0                               | 24.0                            | 20.0                                    |
| 16.   | Phosphate (mg/l)                     | 0.32                                 | 0.3                                | 0.3                             | 0.6                                     |
| 17.   | SO <sub>4</sub> <sup>2-</sup> (mg/l) | 22.5                                 | 11.3                               | 18.4                            | 11.7                                    |
| 18.   | NH <sub>3</sub> -N (mg/l)            | BDL                                  |                                    |                                 |   |
| 19.   | NO <sub>3</sub> -N (mg/l)            | 1.70                                 | 1.42                               | 1.74                            | 1.23                                    |
| 20.   | NO <sub>2</sub> -N (mg/l)            | BDL (DL – 0.02)                      |                                    |                                 |   |
| 21.   | Nitrate (mg/l)                       | 7.54                                 | 6.25                               | 7.71                            | 5.43                                    |
| 22.   | Total Coliform<br>MPN/100 ml         | 350                                  | 540                                | 430                             | 350                                     |
| 23.   | Faecal Coliform<br>MPN/100 ml        | 280                                  | 280                                | 240                             | 170                                     |
| 24.   | Faecal<br>Streptococci<br>MPN/100 ml | <1.8                                 | <1.8                               | <1.8                            | <1.8                                    |

**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY.**

BDL – Below Detectable Limit;

DL – Detection Limit

Note: The parameter Dissolved Oxygen (DO) found to be not meeting the basic criteria prescribed for the survival of aquatic life at location I, III of Olandai Lake & location IV of Velrampet and in case of the Velrampet Lake at location II it is not meeting the standard prescribed for Class (A), (B).

**GOVERNMENT OF PUDUCHERRY**  
**DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT**  
**PUDUCHERRY POLLUTION CONTROL COMMITTEE**

| S.No. | Parameters                           | Olandai<br>(Near Boat<br>House)<br>I | Velrampet<br>(At Boat House)<br>II | Olandai<br>(South Side)<br>III  | Velrampet<br>(Near Pump<br>House)<br>IV |
|-------|--------------------------------------|--------------------------------------|------------------------------------|---------------------------------|---|
| 1.    | Date                                 | 11.10.2021                           | 11.10.2021                         | 11.10.2021                      | 11.10.2021                              |
| 2.    | Time                                 | 12.30 P.M                            | 12.50 P.M                          | 01.15 P.M                       | 01.45 P.M                               |
| 3.    | Weather                              | Clear                                | Clear                              | Clear                           | Clear                                   |
| 4.    | Depth of Water<br>Body               | 1 m                                  | 1 m                                | 1 m                             | 1 m                                     |
| 5.    | Floating Matter                      | Aquatic plants,<br>algae, weeds      | Aquatic plants,<br>algae, weeds    | Aquatic plants,<br>algae, weeds | Aquatic plants,<br>algae, weeds         |
| 6.    | Colour                               | Pale Green                           | Pale Green                         | Pale Green                      | Pale Green                              |
| 7.    | Latitude                             | 11° 54' 52.34"                       | 11° 54' 46.73"                     | 11° 54' 52.27"                  | 11° 54' 25.95"                          |
| 8.    | Longitude                            | 79° 48' 2.69"                        | 79° 47' 50.20"                     | 79° 47' 51.99"                  | 79° 47' 49.29"                          |
| 9.    | Temp °C                              | 29.0                                 | 29.0                               | 31.0                            | 31.0                                    |
| 10.   | pH                                   | 6.78                                 | 7.66                               | 6.95                            | 7.46                                    |
| 11.   | Conductivity<br>(mg/l)               | 934                                  | 834                                | 878                             | 454                                     |
| 12.   | TSS (mg/l)                           | 5.0                                  | 8.0                                | 16.0                            | 11.0                                    |
| 13.   | DO (mg/l)                            | 0.2                                  | 4.7                                | 0.4                             | 4.4                                     |
| 14.   | BOD (mg/l)                           | 0.5                                  | 0.8                                | 0.5                             | 2.0                                     |
| 15.   | Phosphate (mg/l)                     | 0.475                                | 0.733                              | 0.649                           | 0.147                                   |
| 16.   | SO <sub>4</sub> <sup>2-</sup> (mg/l) | 18.92                                | 28.88                              | 23.63                           | 14.93                                   |
| 17.   | NH <sub>3</sub> -N (mg/l)            | 0.032                                | 0.040                              | 0.012                           | 0.033                                   |
| 18.   | NO <sub>3</sub> -N (mg/l)            | 0.012                                | 0.066                              | 0.029                           | 0.049                                   |
| 19.   | NO <sub>2</sub> -N (mg/l)            | 0.007                                | 0.006                              | 0.004                           | 0.004                                   |
| 20.   | Nitrate (mg/l)                       | 0.05                                 | 0.29                               | 0.13                            | 0.22                                    |
| 21.   | Total Coliform<br>MPN/100 ml         | 350                                  | 430                                | 350                             | 350                                     |
| 22.   | Faecal Coliform<br>MPN/100 ml        | 220                                  | 240                                | 280                             | 210                                     |
| 23.   | Faecal<br>Streptococci<br>MPN/100 ml | 240                                  | 170                                | 150                             | 170                                     |

Note: The parameter Dissolved Oxygen (DO) found to be not meeting the basic criteria prescribed for the survival of aquatic life at location I, III of Olandai Lake and in case of the Velrampet Lake it is not meeting the standard prescribed for Class (A), (B).

**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY.**

-13-

*Geani*  
**(G. Rukmani)**  
**Scientist II**

## Designated Best Use Water Quality Criteria

| Designated-Best-Use   | Class of water | Criteria   |
|---|----------------|--|
| Drinking Water Source without conventional treatment but after disinfection | <b>A</b>       | Total Coliforms Organism MPN/100ml shall be 50 or less<br>pH between 6.5 and 8.5<br>Dissolved Oxygen 6mg/l or more<br>Biochemical Oxygen Demand 5 days 20C 2mg/l or less |
| Outdoor bathing (Organised)   | <b>B</b>       | Total Coliforms Organism MPN/100ml shall be 500 or less pH between 6.5 and 8.5<br>Dissolved Oxygen 5mg/l or more<br>Biochemical Oxygen Demand 5 days 20C 3mg/l or less   |
| Drinking water source after conventional treatment and disinfection         | <b>C</b>       | Total Coliforms Organism MPN/100ml shall be 5000 or less pH between 6 to 9<br>Dissolved Oxygen 4mg/l or more<br>Biochemical Oxygen Demand 5 days 20C 3mg/l or less       |
| Propagation of Wild life and Fisheries                                      | <b>D</b>       | pH between 6.5 to 8.5<br>Dissolved Oxygen 4mg/l or more<br>Free Ammonia (as N) 1.2 mg/l or less  |
| Irrigation, Industrial Cooling, Controlled Waste disposal                   | <b>E</b>       | pH between 6.0 to 8.5<br>Electrical Conductivity at 25C micro mhos/cm Max.2250<br>Sodium absorption Ratio Max. 26<br>Boron Max. 2mg/l                                    |

  
**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY,**

ANNEXURE - IV



PUDUCHERRY POLLUTION CONTROL COMMITTEE

INSPECTION REPORT

1. Name of the Lakes : Murungapakkam(Velrampet) and Olandai Lakes, Puducherry Municipality, Puducherry.
2. Activities : Rain Water storage, Ground Water re-charge and Propagation of Fisheries
5. Purpose of Visit : For filing a report in Hon'ble NGT in O.A.No. 129 of 2020(SZ)
6. Date of Visit : 06.11.2021
7. Observations : Photos are enclosed
- i. Both the lakes are with full capacity of water.
- ii. The Murungapakkam (Velrampet) lake is partially covered with Aquatic Plants (Water Lily and Hyacinth) , Algae and Weeds.
- iii. The Olandai lake is thickly covered with dense Aquatic Plants (Water Hyacinth and Lily) Algae and Weeds.
- iv. The excess water from the lakes is discharged through sluice by natural gradient.
- v. Formation of internal bunds are not found inside the lakes.
- vi. Discharge of any effluent or sewage into the lakes is not noticed.

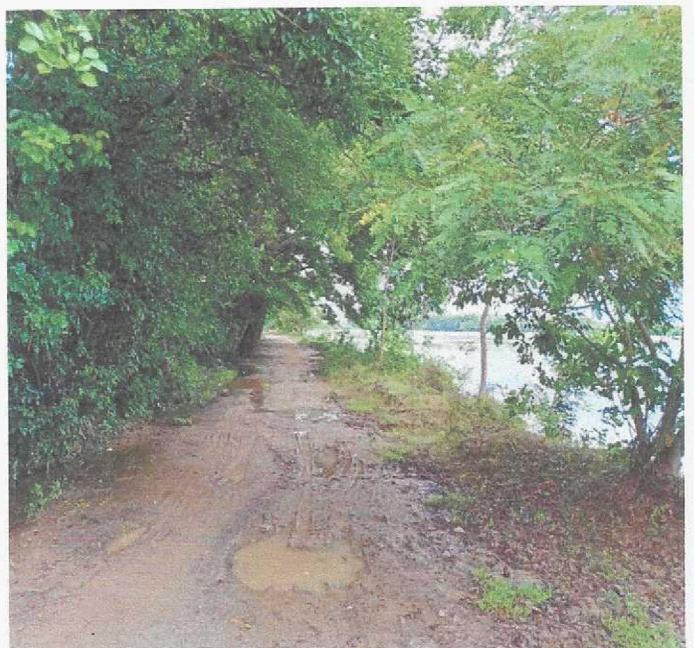
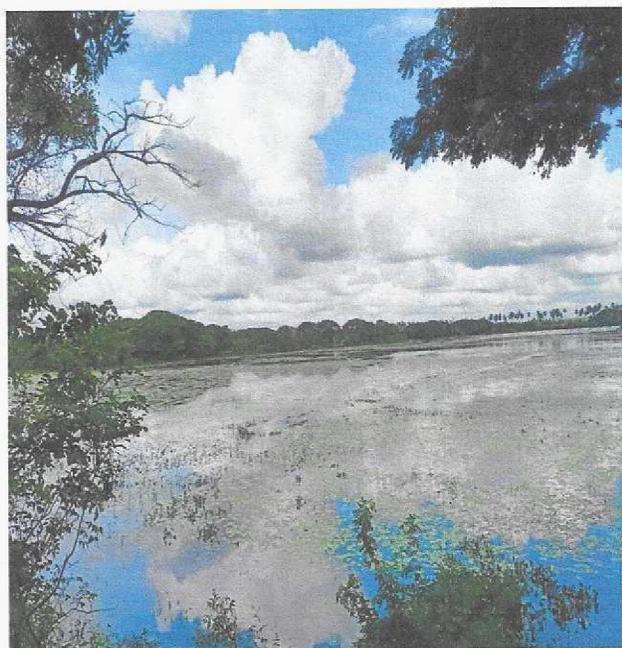
Signature  
Name & Designation  
of the Inspection Officer

  
: (L. Xavier Kennedy)  
Junior Scientific Assistant  
DSTE

  
06.11.2021  
(N. Srinivasa Rao)  
Scientific Officer  
DSTE

  
**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY.**

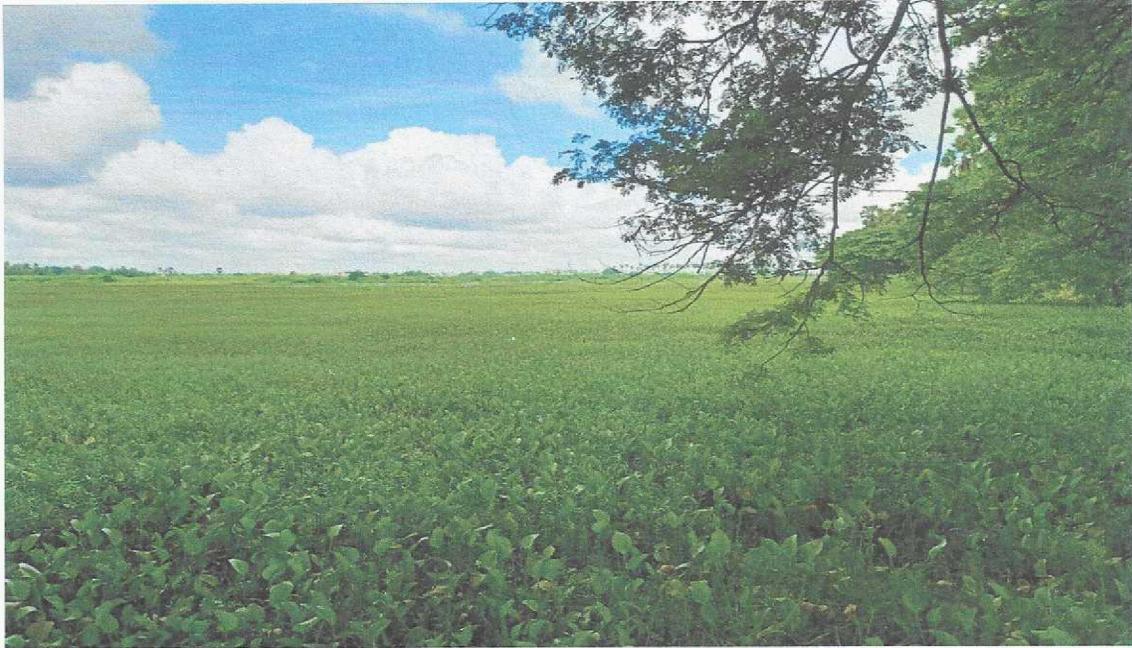
PPCC – INSPECTION OF MURUNGAPAKKAM (VELARANPET)  
LAKE ON 06.11.2021



*Sunny*  
MEMBER SECRETARY  
PUDUCHERRY POLLUTION  
CONTROL COMMITTEE  
PUDUCHERRY.

*M.S.D.*  
DATE  
06.11.2021

PPCC – INSPECTION OF OLANDAI LAKE ON 06.11.2021



*Amrith*  
**MEMBER SECRETARY**  
PUDUCHERRY POLLUTION  
CONTROL COMMITTEE  
PUDUCHERRY.

*h*  
06.11.2021

**ANNEXURE-V**  
**RELEVANT EXTRACT OF**

**“Indicative Guidelines  
for Restoration of Water Bodies”**

(in compliance to Hon'ble NGT Order dated 10.05.2019 in M.A.No. 26/2019 in OA.No. 325 of 2015)



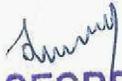
**Central Pollution Control Board**  
(Ministry of Environment, Forest and Climate Change, Govt. of India)  
Parivesh Bhawan, East Arjun Nagar  
DELHI-10 032  
([www.cpcb.nic.in](http://www.cpcb.nic.in))  
June 2019

i

*Annu*  
**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY.**

## CONTENTS

| S.No | Description  | Page No. |
|------|--|----------|
| 1    | Introduction   | 1        |
| 2    | Recognition Phase  | 5        |
| 3    | Restoration Phase  | 8        |
| 4    | Protection Phase   | 16       |
| 5    | Improvement Phase  | 23       |
| 6    | Sustenance Phase   | 38       |
| 7    | References   | 39       |
| 8    | <b>List of Figures</b>   |          |
|      | <b>Figure 1.</b> A Model Lake or Pond Restoration Technique                                  | 28       |
|      | <b>Figure 2.</b> Model Flow Chart for Restoration of Pond or Lake                            | 29       |
|      | <b>Figure 3.</b> Model Flow Chart for Rejuvenation of Polluted Rivers                        | 37       |
|      | <b>Figure 4.</b> Flow Chart Showing Criteria for Categorization of River Monitoring Location | 48       |
|      | <b>List of Annexures</b>   |          |
|      | <b>Annexure-I:</b> Water Quality Criteria-Designated Best Use                                | 41       |
|      | <b>Annexures-II:</b> Criteria for categorization of river monitoring location                | 42       |

  
**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY.**

**B. Industrial effluent management:** - for management of industrial effluent inflow by having adequate infrastructure for treatment of industrial effluent in the form of captive industrial effluent treatment plants or through common effluent treatment plants by the respective industry contributing to the pollution of water bodies and same also should be ensured by the respective State Industrial Development Corporations or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC). Adoption of state-of-the technologies for production processes and for ensuring treatment of generated industrial effluent (feasibility adoption of zero liquid discharge).

**C. Management of waste**

- Adequate infrastructure should be ensured for management of wastes (such as municipal solid waste, industrial hazardous waste, construction and demolition waste, plastic waste, e-waste) in accordance with the respective provisions notified under the Environment (Protection) Act, 1986, by all the concerned.
- Periodic physical removal of improperly disposed wastes (such as municipal solid waste, construction and demolition waste, plastic waste, industrial hazardous waste, human and animal night soils) by the concerned local or urban body.

**D. De-siltation**

- Periodic removal of nutrient enriched accumulated sludges in ponds and lakes helps in ground water recharge potential, removal of contaminated sediments as well as increases storage capacity of lakes or ponds.

*Shree*  
**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY.**

- Sediments removed from the ponds or lakes should be stored in a designated area (till moisture is completely drained out) at a suitable distance away from ponds or lakes and such dried sediments should be removed immediately so that sediments will not become a part of ponds or lakes once again especially in the event of any rain fall. Depending on the characteristics, such sediments after draining may be used as manure (complying to the manure quality prescribed under Solid Waste Management Rules, 2016 as amended from time to time or disposed of in accordance with the relevant provisions notified under Environment (Protection) Act, 1986.

#### **E. De-weeding**

- **Periodic dredging** (once in three months) of 80 % of dense and thickly covered aquatic plants viz., floating plants such as algae, duckweed, watermeal, water hyacinth; submerged plants such as milfoil, hydrilla, water lettuce, curly-leaf pondweed, clasping-leaf pondweed, coontail, sago pondweed, water lily, water shield etc., bottom sediment, and associated nutrients should be carried out. De-weeding methods include: -
  - **Preventive measures**
    - such as proper design and construction of ponds or lakes including levelling and smoothing of banks
  - **Manual or physical control measures**
    - Manual or physical control measures such as non-chemical and non-motorized measures be taken for removal of weeds (manual harvesting) using hand pulling, rakes, cutters, benthic barriers, drawdown, aeration, shading and weed rollers as these measures are typically very low, however, such measures

  
**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY.**

are labor intensive and are therefore better suited to small, less established weed populations. Hand pulling and raking may result in turbid or murky water and may create plant fragments that can subsequently spread to new sites.

➤ **Mechanical control measures**

- Using motor-driven under water weed cutters or floating weeds, rotovators essentially large-scale underwater rototillers for tilling up lake or pond sediments as well as to chop and loosen plant roots, or draglines (in case of underwater pond or lake dredging) (or) dry-land excavation machinery such as bulldozers (in case of drained ponds or lakes) shall be used (or)
- Limiting the amount of sunlight available to aquatic plants by floating black plastic sheeting on the water surface (or) use of dark-colored and nontoxic water dyes (such as nigrosine, aniline and aqua-shade)

- **Biological controls** i.e., introducing aquatic animals and plants that eat or compete with waterweeds. Herbivorous animals (those that eat plants) include a wide variety of insects, snails, crayfish, tadpoles, turtles, fish (sterile, triploid grass carp), ducks, geese, and swans which can be stocked in ponds or lakes to consume aquatic plant.

➤ **Application of common aquatic herbicides for control of lake or pond weeds**

Use of herbicides is not recommended as it may kill fish in ponds or lakes. Herbicides should be used in a controlled and systematic way under the supervision of the expert and general herbicides that may be used for weed control are as given below-

*Anand*  
**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY.**

- For Algae (microscopic, filamentous, Chara) control- Herbicides such as copper sulfate, copper chelates, endothall,, simazine)
- Submerged Plants (coontail, watermilfoil, pondweeds such as sago, curlyleaf, leafy) control- Herbicides such as Endothall, Diquat, simazine, fluridone may be used
- Free-floating plants (duckweed, watermeal) control:- Herbicides such as Diquat, simazine may be used
- Rooted-floating plants such as (waterlilies, spanerdock) control- Herbicides such as Glyphosate and 2,4,-D may be used
- Emergent plants (cattails, perennial grasses, and broadleaves) control: - Herbicides such as Glyphosate may be used

**F. Prohibition of discharges or disposal of waste or washing activity and action against violators**

- Ban on discharge of industrial effluent or sewage or waste (such as municipal solid waste or industrial hazardous waste or plastic waste or construction and demolition waste or sludges from septic tanks/ STPs/CETPs) into lakes or ponds or drainage channels connected with ponds or lakes or open defecation in the vicinity as well as washing of clothes or wading of cattle
- Stringent actions be taken against violating industry by the SPCB/PCC as per provisions under Water (Prevention and Control of Pollution) Act, 1974 as well as Environment (Protection) Act, 1986

  
**MEMBER SECRETARY**  
**PUDUCHERRY POLLUTION**  
**CONTROL COMMITTEE**  
**PUDUCHERRY,**